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THE

ONTARIO WATER RESOURCES

COMMISSION

WATER POLLUTION SURVEY

of the

POLICE VILLAGE OF RUSSELL

COUNTY OF RUSSELL

1966

POLICE VILLAGE OF RUSSELL

1966

COUNTY OF RUSSELL

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Report on a water pollution
survey of the police village of
Russell in the township of Russel
in the county of Russell.

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THE
ONTARIO WATER RESOURCES
COMMISSION

Report on

a

WATER POLLUTION SURVEY

of the

POLICE VILLAGE OF RUSSELL

TOWNSHIP OF RUSSELL

in the

COUNTY OF RUSSELL

Division of Sanitary Engineering

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WATER POLLUTION SURVEY
of the
POLICE VILLAGE OF RUSSELL

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Laboratory Results
Map of Police Village of Russell

WATER POLLUTION SURVEY
of the
POLICE VILLAGE OF RUSSELL

INTRODUCTION

A water pollution survey of the Police Village of Russell was performed on September 24, 1965. Surveys of this nature are conducted by the Ontario Water Resources Commission for the purpose of locating and recording sources of existing and potential pollution of watercourses. Enquiries and investigations are made with respect to outfalls which discharge to local watercourses and samples are collected to determine the significance of the outfall discharges and their effects on the receiving streams. Where pollution sources are noted, recommendations are made concerning their abatement.

Valuable assistance was received from the following officials:

Mr. P. Bissonnette, Clerk-Treasurer, Township of Russell;
Mr. K.M. Boyd, Secretary, Board of Trustees; Police Village of
Russell;
Mr. R. Leblanc, Public Health Inspector, Prescott & Russell
Health Unit.

It should be noted that the comments in this report pertain to conditions as they existed at the time of the survey. A map of the Police Village of Russell showing sampling point locations is appended for reference.

PREVIOUS RECOMMENDATIONS AND ACTION TAKEN

A previous water pollution survey was conducted at Russell in July 1962. Recommendations presented as a result of that survey were as follows:

"Sewage disposal problems in the Police Village of Russell should be resolved without delay. This can be accomplished either by providing adequate private sewage disposal facilities or by acquiring sanitary sewers and appropriate sewage treatment works."

A sewage works programme for Russell has not been implemented to date. A preliminary engineering report on sewage works was prepared for the municipality by the firm of J.L. Richards and Associates Limited, Consulting Engineers, in January 1962. However, the Board of Trustees for the Police Village of Russell elected not to proceed with a sewage programme at that time.

The provision of adequate private sewage disposal facilities as an alternative to community sewage works has not been successful.

POLICE VILLAGE OF RUSSELL

Russell is located in a mixed-farming area in the south-western area of the County of Russell. It is approximately 25 miles south-east of Ottawa, where many of the village residents are employed. There is no industry in the village. According to the Municipal Directory, the population of the village was 560 in 1964, an increase of four persons since 1962.

DRAINAGE

Drainage from Russell is to the Castor River which flows in an easterly direction through the community. Flow in the river at the village was minimal at the time this survey was conducted.

The locations of storm sewer outfalls and drainage courses within the community are indicated on the appended map.

WATER SUPPLY

Water is obtained from individual well supplies most of which are drilled. An 18 to 20-foot overburden of clay and loam soil is found above a limestone rock formation. Water quality is generally satisfactory with fluorides occurring naturally in some well supplies.

WASTE DISPOSAL

Sanitary Wastes

Sewage disposal is effected on an individual basis. Subsurface tile bed systems are normally employed to receive the septic tank discharges. However, many properties in the older developed areas of the village, reportedly, discharge sanitary wastes either directly or indirectly to the storm sewer system. These unsatisfactory connections have been made because of insufficient space on some properties to install adequate tile beds. Untreated sanitary wastes from at least two properties, including the Russell Public

School and the Russell Hotel are discharged directly to the Castor River. Extensive dye-testing would be necessary to determine the extent of unsatisfactory sewage disposal facilities.

Refuse Disposal

Refuse from the village is collected on a regular basis and removed to a municipal dump located just north of the Police Village of Embrun. Maintenance of this open dump is provided by the Township of Russell.

SAMPLING PROCEDURES

Samples were collected from the Castor River and from evident discharges to this watercourse. Sanitary chemical analyses were performed at the OWRC Laboratory in Toronto. Bacteriological examinations were made at the Ontario Department of Health Regional Laboratory in Ottawa. The sample results are recorded in the appendices of this report along with those of the previous survey. Seasonal weather conditions prevailed during the sampling period and dry weather flows were experienced.

INTERPRETATION AND SIGNIFICANCE OF LABORATORY RESULTS

Bacteriological Examination

The Membrane Filter (MF) technique is employed at the OWRC Laboratory to obtain a direct enumeration of coliform organisms and is reported per 100 millilitres (ml) of the sample. The Department of Health Laboratories utilize the Multiple Tube Fermentation procedure and determinations are made as a Most Probable Number (MPN)

of bacteria per 100 millilitres. The presence of coliforms may indicate pollution from both faecal and non-faecal sources while E. coli organisms indicate pollution of intestinal origin only. The maximum limit of 2,400 coliform organisms per 100 millilitres is the objective for bacteriological quality of surface water in Ontario.

Sanitary Chemical Analyses

Biochemical Oxygen Demand (BOD)

The BOD of sewage or polluted waters is the oxygen required during stabilization of the decomposable organic material by aerobic biochemical action. A five-day BOD determination with incubation at 20 degrees Centigrade is reported. A high BOD is indicative of organic or chemical pollution. A desirable upper limit in surface water is four(4) parts per million (ppm) while the objective maximum in waste discharges to a watercourse is 15 ppm.

Solids

The value for total solids expressed in parts per million (ppm) is the sum of the values for the suspended and dissolved matter in water. The concentration of suspended solids which indicates the measure of undissolved solids of organic or inorganic nature is generally the most significant of the solids analyses in regard to surface-water quality. The effects of suspended solids in water are reflected in difficulties associated with water purification, deposition in streams, and injury to the habitat of fish. It is considered that these conditions might occur when the suspended solids

concentration of waste discharges becomes greater than 15 ppm. Where suspended solids values, ascertained by a quantitative analysis, approach 20 ppm or less, laboratory difficulties usually result in these values being determined as turbidity, a qualitative analysis.

SAMPLE RESULTS AND OBSERVATIONS

The marked increase in coliform concentrations in samples collected from the Castor River indicates a degradation of water quality as the river proceeds past the Police Village of Russell. Satisfactory water quality was noted in the watercourse upstream.

Excessive coliform, BOD, and suspended solids concentrations were noted in all storm or private sewer discharges sampled for either bacteriological examination and chemical analysis or, for bacteriological examination only. The results of laboratory analyses indicate that sanitary wastes are gaining access to the majority of municipal storm sewers in the community. Sanitary wastes were observed to be gaining access to the river from the Russell Public School (sampling point NR-54.52 P), the Russell Hotel (sampling point NR-54.00 P), and from a storm sewer on the west side of Concession Street (sampling point NR-54.10 W). The use of fluorescein dye-testing confirmed the source of the Russell Hotel discharge.

A combination of low summer flows in the Castor River and the domestic waste discharges from Russell have resulted in a marked reduction of the physical attractiveness of the river within the community. The high nutrient content of the expelled wastes contribute to the profuse algae growths in the river.

DISCUSSION

A previous OWRC report recommended that the Police Village of Russell should correct its sewage disposal problems. It appears that correction of these problems on an individual basis may be difficult because of insufficient space available on many properties for the installation of adequate subsurface disposal systems. Provision of a municipal type sewage works might therefore be necessary to prevent degradation of water quality in the Castor River at this community.

METHODS OF FINANCING WATER AND SEWAGE WORKS PROGRAMMES

The following methods for implementing water and sewage works programmes are now available in the Province of Ontario:

1. By proceeding with the construction independently, meeting capital costs by the sale of debentures.
2. By entering into an agreement with the OWRC for the construction of projects with an obligation to pay debt retirement and operating charges over the term of the agreement with the facilities reverting to the municipality at the end of the term of the agreement.
3. By requesting the provision of a provincially-owned project in which the province's costs of supplying these works, including amortization of capital costs together with operating and maintenance charges, are to be recovered by the sale of service to affected municipalities by rates on a use basis. The project would

be wholly owned by the Province of Ontario and any municipality proceeding on this basis would be in a position to sign a contract with the Commission for service. Installations would be operated entirely at cost with provisions for adjustments in rates. In sewage works, the applicable portions would include outfall sewers, treatment works and main connecting facilities to the treatment works.

SUMMARY

A water pollution survey of the Police Village of Russell was performed on September 24, 1965. Samples were collected from the Castor River and from pertinent discharges thereto.

Laboratory analyses revealed that untreated or inadequately treated sewage flows are gaining access to the river by means of municipal storm sewers and private drains. This has resulted in a degradation of the bacteriological and aesthetic quality of the watercourse.

The waste disposal problems pointed out in a previous OWRC survey of Russell conducted in 1962, have not been resolved. Various methods for proceeding with a municipal sewage project have been included in this report.

RECOMMENDATIONS

1. The municipality should take steps to eliminate the discharge of untreated or inadequately treated wastes to the storm sewers.

2. The Russell Hotel and the Russell Public School should discontinue the direct discharge of sanitary wastes to the river and initiate an approved method of waste disposal.

3. If it is impractical to correct the sewage disposal problems in the Police Village of Russell on an individual basis, then negotiations to provide a municipal type sewage works should be commenced.

All of which is respectfully submitted,

Approved by: L. G. South
L. G. South,
District Engineer,
Division of Sanitary Engineering.

Prepared by: W. C. Stevens

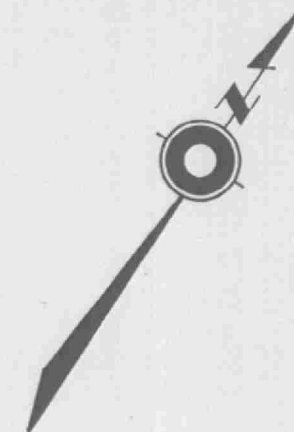
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WATER POLLUTION SURVEY

POLICE VILLAGE OF RUSSELL

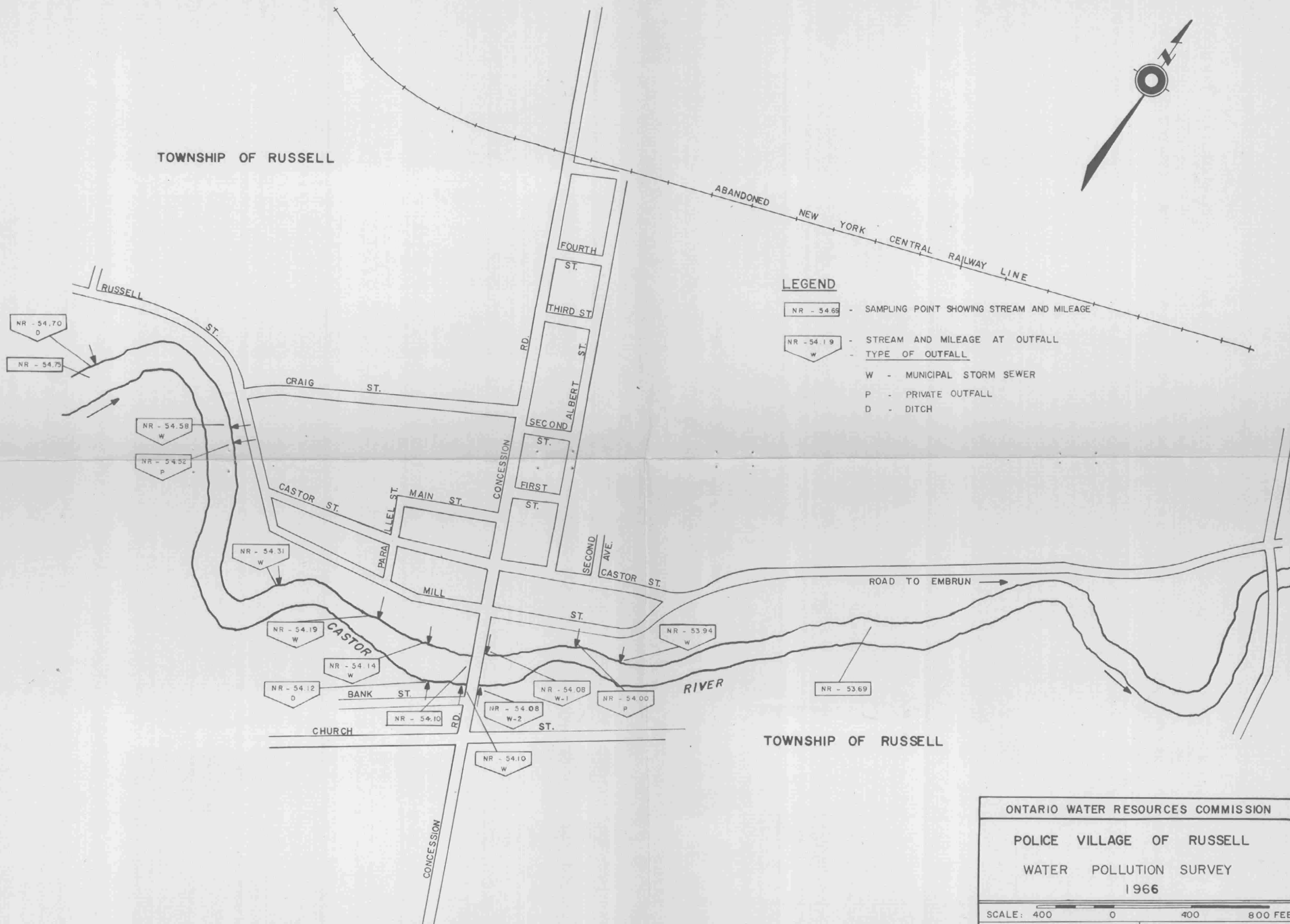
SAMPLE POINT NO.	DESCRIPTION	DATE	M.F.	M.P.N.		5-DAY BOD	S O L I D S			TURBIDITY UNITS
			COLIFORMS PER 100 ML.	TOTAL COLIFORM ORGANISMS	E. COLI		TOTAL	SUSP.	DISS.	
NR-53.69	CASTOR RIVER AT DOWNSTREAM LIMITS OF RUSSELL	JULY 18/62	57,000	---	---	2.5	266	--	--	2.9
		SEPT.24/65	---	11,000+	11,000+	0.6	402	1	401	---
NR-53.94 W	ALBERT STREET STORM SEWER OUTFALL TO NORTH BANK OF RIVER	JULY 18/62	4,600,000	---	---	74.0	750	34	715	---
		SEPT.24/65	---	11,000+	11,000+	110.0	986	118	868	---
NR-54.00 P	PRIVATE OUTFALL - RUSSELL HOTEL	SEPT.24/65	DIRECT DISCHARGE TO NORTH BANK OF RIVER - INSUFFICIENT FLOW FOR SAMPLING							
NR-54.08 W-1	CONCESSION STREET STORM SEWER OUTFALL TO NORTH BANK OF RIVER (VICINITY SAMPLE)	JULY 18/62	3,400,000	---	---	3.8	290	--	---	2.8
		SEPT.24/65	---	11,000+	11,000+	200.0	1736	902	834	---
NR-54.08 W-2	STORM SEWER OUTFALL TO SOUTH BANK OF RIVER ON EAST SIDE OF CONCESSION STREET	SEPT.24/65	---	11,000+	11,000+	---	--	--	---	---
NR-54.10	CASTOR RIVER AT CONCESSION STREET BRIDGE	JULY 18/62	3,300	---	---	1.4	252	--	---	2.8
		SEPT.24/65	---	4,600	4,600	1.4	364	3	361	---
NR-54.10 W	STORM SEWER OUTFALL TO SOUTH BANK OF RIVER ON WEST SIDE OF CONCESSION STREET	SEPT.24/65	EVIDENCE OF SANITARY WASTES - INSUFFICIENT FLOW FOR SAMPLING							
NR-54.12 D	OPEN DITCH TO SOUTH SIDE OF RIVER - WEST OF CONCESSION STREET	SEPT.24/65	NO FLOW							
NR-54.14 W	STORM SEWER OUTFALL TO NORTH BANK OF RIVER - ON EAST SIDE OF PARK	SEPT.24/65	---	11,000+	11,000+	---	--	--	--	---
NR-54.19 W	STORM SEWER OUTFALL TO NORTH BANK OF RIVER OPPOSITE PARALLEL STREET	JULY 18/62	22,000,000	---	---	---	--	--	--	---
		SEPT.24/65	---	11,000+	11,000+	---	--	--	--	---
NR-54.31 W	STORM SEWER OUTFALL OPPOSITE RUSSELL STREET (VICINITY SAMPLE)	SEPT.24/65	---	11,000+	11,000+	7.8	428	40	388	---
NR-54.52 P	RUSSELL PUBLIC SCHOOL	SEPT.24/65	---	11,000+	11,000+	190.0	1326	488	838	---
NR-54.58 W	STORM SEWER OUTFALL TO NORTH BANK OF RIVER - OPPOSITE CRAIG STREET	SEPT.24/65	---	11,000+	12,400	400.0	1796	350	1446	---
NR-54.70 D	DITCH TO NORTH BANK OF RIVER - NEAR WESTERLY VILLAGE LIMITS	SEPT.24/65	INSUFFICIENT FLOW FOR SAMPLING							
NR-54.75	CASTOR RIVER AT UPSTREAM LIMITS OF RUSSELL	JULY 18/62	70	---	---	2.6	266	--	--	2.6
		SEPT.24/65	---	23	23	0.6	486	4	482	---

TOWNSHIP OF RUSSELL



LEGEND

- NR - 54.65 - SAMPLING POINT SHOWING STREAM AND MILEAGE
- NR - 54.19 - STREAM AND MILEAGE AT OUTFALL
- W - MUNICIPAL STORM SEWER
- P - PRIVATE OUTFALL
- D - DITCH



ONTARIO WATER RESOURCES COMMISSION

POLICE VILLAGE OF RUSSELL

WATER POLLUTION SURVEY

1966

SCALE: 400 0 400 800 FEET

DRAWN BY: M.I.H.

DATE: JUNE 1966

CHECKED BY: R.W.

DRAWING NO 66-39